



# **Electricity spot prices above \$5000/MWh**

**Victoria and South Australia,  
19 January 2018**

20 March 2018

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# 1 Obligation

The Australian Energy Regulator regulates energy markets and networks under national legislation and rules in eastern and southern Australia, as well as networks in the Northern Territory. Its functions include:

- monitoring wholesale electricity and gas markets to ensure energy businesses comply with the legislation and rules, and taking enforcement action where necessary;
- setting the amount of revenue that network businesses can recover from customers for using networks (electricity poles and wires and gas pipelines) that transport energy;
- regulating retail energy markets in Queensland, New South Wales, South Australia, Tasmania (electricity only), and the ACT;
- operating the Energy Made Easy website, which provides a retail price comparator and other information for energy consumers;
- publishing information on energy markets, including the annual State of the energy market report, to assist stakeholders and the wider community.

The AER is required to publish a report whenever the electricity spot price exceeds \$5000/MWh in accordance with clause 3.13.7 (d) the National Electricity Rules.

The report:

- describes the significant factors contributing to the spot price exceeding \$5000/MWh, including withdrawal of generation capacity and network availability;
- assesses whether rebidding contributed to the spot price exceeding \$5000/MWh;
- identifies the marginal scheduled generating units; and
- identifies all units with offers for the trading interval equal to or greater than \$5000/MWh and compares these dispatch offers to relevant dispatch offers in previous trading intervals.

These reports are designed to examine market events and circumstances that contributed to wholesale market price outcomes and are not an indicator of potential enforcement action.

## 2 Summary

On 19 January maximum temperatures in Melbourne and Adelaide exceeded 40°C, leading to high demand for electricity and forecast high prices. While demand for electricity was high in both the South Australian and Victorian regions, it was not near record levels. In South Australia the spot price reached \$11 864/MWh at 2.30 pm, \$13 408/MWh at 3 pm, \$5413/MWh at 5 pm and \$5332/MWh at 6 pm. The spot price exceeded \$5000/MWh only once in Victoria, reaching \$10 152/MWh at 2.30 pm.

The vast majority of capacity in both regions was priced in very low price bands, a small amount in very high price bands and almost no mid-priced capacity. As a result, small increases in demand at the top end of low priced capacity had the potential to lead to high prices. This was essentially the major contributing factor behind the high price outcomes.

Against the backdrop of forecast hot weather in South Australia and Victoria, AEMO, the market operator, forecast tight supply and demand conditions in both regions some days in advance. Seeking a market response, AEMO issued forecast lack of reserve notifications for Victoria for 19 January from as early as 16 January and on the day in South Australia.

Due to the ever tightening supply and demand balance in both regions, at around 2 pm, AEMO activated Reliability Emergency Reserve Trader (RERT) contracts in Victoria and South Australia. As a result, AEMO invoked special pricing arrangements called “what-if” pricing. “What-if” pricing sets the price as if the intervention, in the case the activation of the RERT contracts, had not occurred so as to preserve market price signals.

Rebidding did not contribute to the high price outcomes.

## 3 Analysis

The Australian Energy Market Operator (AEMO) makes regular assessments of expected demand for electricity in each region, based on inputs including forecast temperature, season and the day of the week. AEMO issues “targets” to generators to generate electricity to meet this demand, taking into account network capability and generator offers. Generator offers comprise the mega-watt (MW) capacities generators are willing to supply at a range of prices and the total amount the generator can produce (generator availability).

To inform market participants about market conditions, AEMO publishes price, network capability and demand forecasts in five minute and 30 minute timeframes, updated every five minutes. These forecasts form the basis for AEMO’s assessments of interconnector capacity, transfers between regions, reserves and conditions that relate to power system security.

The spot price reached \$10 152/MWh in Victoria at 2.30 pm. In South Australia the spot price reached \$11 864/MWh at 2.30 pm, \$13 408/MWh at 3 pm, \$5413/MWh at 5 pm and \$5332/MWh at 6 pm.

The following sections examine why the high spot prices occurred.

### 3.1 Significant events leading up to and on 19 January

Against the backdrop of forecast hot weather in South Australia and Victoria, AEMO forecast tight supply and demand conditions in Victoria and South Australia some days in advance. Seeking a market response, AEMO issued forecast lack of reserve (LOR) notifications for Victoria for 19 January from as early as 16 January, as shown in Figure 1. Lack of Reserve levels are explained further in Box 1 and Appendix F.

#### **Box 1: Lack of Reserves**

AEMO is required to monitor the level of reserve, or spare capacity, for each region of the NEM. Reserve levels are an indicator of the supply demand balance of a region, which AEMO communicates to the market via reserve notices. AEMO publish both forecast and actual reserve notices.

The reserve notices focus on three thresholds in ascending order of severity: Lack of Reserve (LOR) 1, 2 and 3. Each threshold is based on the number of unplanned failures of either transmission or generating equipment (known as credible contingencies) that should they occur, would result in AEMO having to shed load.

Figure 1 provides an overview of the sequence of events that led to AEMO activating Reliability Emergency Reserve Trader (RERT) contracts in South Australia and Victoria.<sup>1</sup>

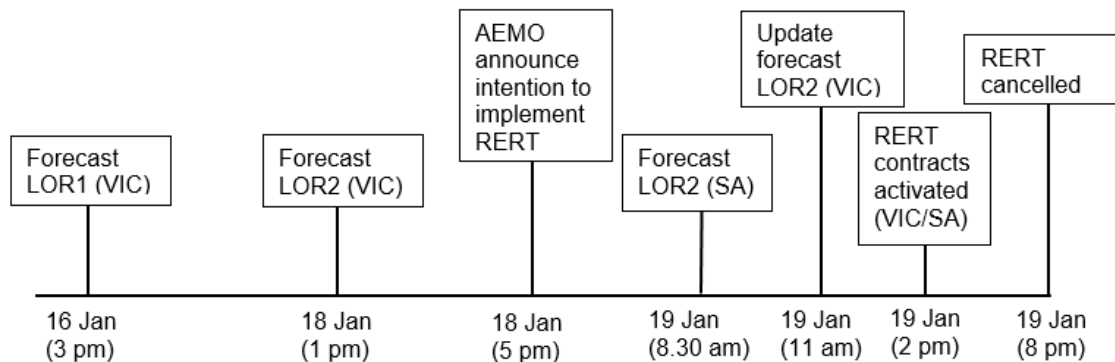
<sup>1</sup> The RERT is a function available to AEMO to maintain power system reliability and security. Through the RERT, large electricity users, generators and aggregators who can procure demand response can be contracted by AEMO to either use less energy or generate power from their own generators.

As the forecast level of reserves decreased in Victoria (shown by the forecast LOR2 on 18 January), AEMO announced its intention to implement RERT contracts (some of the potential RERT contract participants may require advanced notice to prepare to meet their contract obligations). This effectively means AEMO notified RERT contract participant(s) that they may be required to activate their contract(s) on 19 January.

On the morning of 19 January, AEMO announced a forecast LOR2 in South Australia and updated their forecast LOR2 in Victoria. At 11 am AEMO notified the market that unless the market provided adequate additional capacity to manage the LOR shortfall by midday it would intervene by activating RERT contracts.

Due to the ongoing forecast shortfall in reserve capacity in both regions, at around 2 pm, AEMO activated RERT contracts in both Victoria and South Australia.

**Figure 1: Timeline of events for 19 January**



The activation of the RERT contracts effectively lowered actual demand, or increased available supply, in both regions. The total amount of RERT contracts activated was 130 MW in Victoria and 6.5 MW in South Australia. The majority of contracts were activated at 2 pm and ran until between 5 and 8 pm.

When AEMO activates RERT contracts, prices for all regions across the NEM are determined using “what-if” pricing. “What if” pricing is discussed in more detail in Box 2 and Appendix E.

## Box 2: “What-if” pricing

The market operator, AEMO, invokes “what-if” pricing when it intervenes in the market, for example by activating RERT contracts.

Normally AEMO sets targets for generation and interconnectors and determines wholesale electricity market prices (energy and FCAS) in a single calculation (or “run”) for every five minute dispatch interval. After an intervention these are calculated twice for each dispatch interval, one taking into account the RERT contracts called “Intervention” and one that does not include the direction called “What-if”.

The “What-if” attempts to calculate what the price would have been had AEMO not intervened in the market. This effectively removes the effects of the RERT contracts thereby preserving the market price signal. To achieve this, the “what-if” run recalculates, amongst other things, the level of demand and the targets for generation and interconnectors.

AEMO is required to publish reports detailing the circumstances that gave rise to the need for the activation of RERT contracts, their processes and the costs that occurred.<sup>2</sup>

### 3.2 Tight supply/demand conditions were expected to lead to high prices

The first forecast for 19 January (which occurs 12.30 pm the day prior) showed prices above \$5000/MWh were forecast from 2.30 to 4.30 pm in Victoria and from 2.30 to 6.30 pm in South Australia.

The prices in Table 1 and Table 2 are “what-if” prices.<sup>3</sup> “What-if” pricing occurred from 2.05 pm to 8 pm across all regions of the NEM.<sup>4</sup> Demand and generator availability figures are actual values, not from the “what-if” pricing run. The actual figures have been included as they reflect the actual level of demand and generator availability during the high price periods.

#### Victoria

Table 1 shows:

- Four ahead of the high price events, spot prices were expected to exceed \$9900/MWh for the 2.30 pm, 3 pm, 5 pm and 6 pm trading intervals. The only trading interval where the spot price actually exceeded \$5000 was 2.30 pm.
- Forecasts four hours prior to the 2.30 pm trading interval for electricity demand were around 300 MW lower than forecast and the total capacity available from local generators (availability) was around 100 MW lower than forecast.

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<sup>2</sup> NER, cl. 3.20.

<sup>3</sup> Intervention prices are shown in Appendix E.

<sup>4</sup> “What if” pricing is invoked in all regions simultaneously.



**Table 1: Actual and forecast spot price, demand and available capacity for Victoria**

Trading interval	Price (\$/MWh)			Demand (MW)			Generator Availability (MW)		
	“What-if”	4 hr forecast	12 hr forecast	Actual	4 hr forecast	12 hr forecast	Actual	4 hr forecast	12 hr forecast
2.30 pm	10 152	14 200	12 898	8814	9113	8854	8838	8947	8979
3.00 PM	104	14 200	13 303	8867	9221	8950	8879	8944	9003
5.00 pm	4967	13 263	10 000	8889	9105	8764	8922	8926	8988
6.00 PM	90	10 000	130	8565	8721	8315	8894	8896	8948

### South Australia

Table 2 shows:

- Four and 12 hours ahead of the high price event, spot prices were expected to exceed \$11 500/MWh for the 2.30 pm, 3 pm, 5 pm and 6 pm trading intervals. Actual spot prices ended up lower than expected, but still above \$5000/MWh.
- For the high price intervals, demand for electricity was between 100-185 MW lower than forecast four hours prior.
- Local generator availability was lower than forecast for the 2.30 pm and 3 pm trading intervals by around 220 MW and around 70 MW for the 5 pm trading interval. This was mainly due to lower than forecast semi-scheduled wind generation. For the 6 pm trading interval availability was close to expected.

**Table 2: Actual and forecast spot price, demand and available capacity for South Australia**

Trading interval	Price (\$/MWh)			Demand (MW)			Generator Availability (MW)		
	“What-if”	4 hr forecast	12 hr forecast	Actual	4 hr forecast	12 hr forecast	Actual	4 hr forecast	12 hr forecast
2.30 pm	11 864	14 200	13 100	2458	2566	2566	2926	3150	3165
3.00 pm	13 408	14 200	13 999	2447	2607	2610	2878	3090	3086
5.00 pm	5413	14 200	13 100	2602	2784	2758	2806	2877	2853
6.00 pm	5332	11 686	13 099	2620	2771	2735	2836	2827	2799

### 3.3 Overview of Supply and Demand

Generators determine the amount of electricity or capacity (MW) they offer and the price they are prepared to receive (\$/MWh) in ten price and quantity (MW) pairs. AEMO aggregates these offers from lowest to highest price to produce a dispatch stack. Every five minutes AEMO then “dispatches” sufficient capacity from each generator, on the basis of that dispatch stack and accounting for transmission capability, to meet forecast regional electricity demand at the lowest possible price.

The price of the highest offer needed to meet demand sets the 5-minute dispatch price. The spot price paid to generators is the average of the six dispatch prices that make up the 30 minute trading interval; all dispatched generators are paid at this price for the amount of electricity that they produced, regardless of how they bid.

The following sections analyse supply and demand conditions relevant to the high prices.

The demand and supply values used represent what actually happened in the market. In other words, what the actual level of demand for electricity was and the actual offers (and re-offers) generators made. These are the values we have used to examine the market events and circumstances that contributed to wholesale market price outcomes.

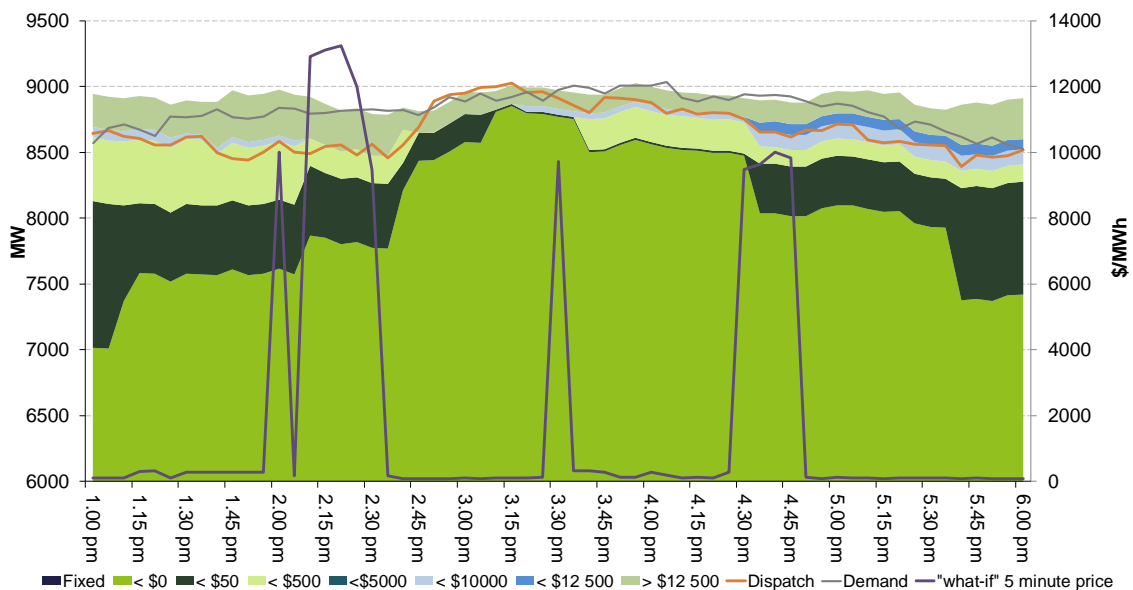
### 3.3.1 Supply

This section examines the supply side factors that had an effect on the high price outcomes. Network availability has not been included as the “what if” pricing approach makes the correlation between forecast network limits and actual outcomes problematic.

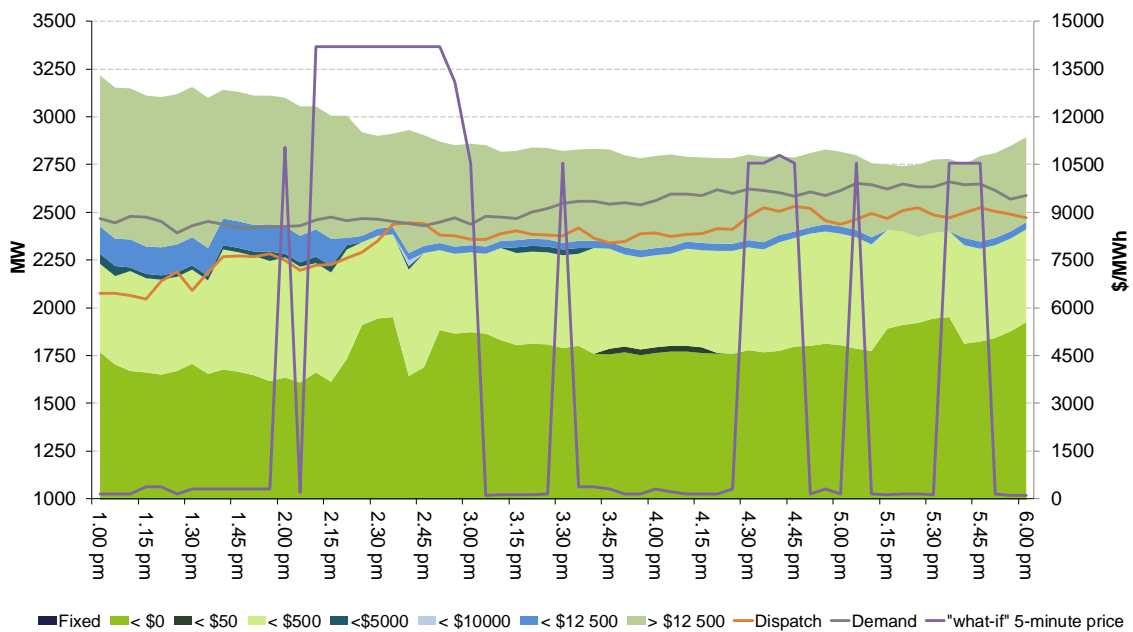
#### 3.3.1.1 Generator offers

Figure 2 and Figure 3 show the cumulative generator offers for Victoria and South Australia respectively. Also known as closing bids, the figures show the actual capacity offered by generators in each region, including amendments to their offers throughout the day to match changes to their own economic and/or physical positions (known as “re-bidding”). Also shown on the figures are the “what-if” 5 minute price (purple line), actual demand (grey line) and actual local generation output (orange line).

**Figure 2: Closing bids for Victoria**



**Figure 3: Closing bids for South Australia**



In initial forecasts, generators in Victoria offered up to 95 per cent of their capacity in low price bands. Generators rebid further capacity into low price bands throughout the day, such that for each trading interval from 2 pm to 6 pm, on average approximately 97 per cent of capacity was priced below \$500/MWh, with the remaining three per cent priced above \$9000/MWh.

Initial forecasts in South Australia showed that generators offered up to 67 per cent of their capacity in low price bands. As was the case in Victoria, generators rebid further capacity into low price bands such that for each trading interval from 2 pm to 6 pm, on average approximately 82 per cent of capacity was priced below \$2000/MWh with the remaining 18 per cent priced above \$10 000/MWh.

Significant rebids can be seen in Appendix A.

Capacity priced between \$500/MWh and \$5000/MWh is shown as a dark blue band while capacity priced between \$5000/MWh and \$10 000/MWh appears as a pale blue band. As shown in both figures, there was little or no capacity priced in these ranges in either region. Most of the capacity was priced in low price bands, less than \$500/MWh, with a small amount priced in high price bands greater than \$12 500/MWh. Consequently, small increases in demand above the top of the low priced capacity led to high prices.

### 3.3.2 Demand

On 19 January maximum temperatures in Melbourne and Adelaide exceeded 40°C<sup>5 6</sup>, leading to high forecast demand for electricity.

<sup>5</sup>[http://www.bom.gov.au/jsp/ncc/cdio/weatherData/av?p\\_nccObsCode=122&p\\_display\\_type=dailyDataFile&p\\_startYear=&p\\_c=&p\\_stn\\_num=023000](http://www.bom.gov.au/jsp/ncc/cdio/weatherData/av?p_nccObsCode=122&p_display_type=dailyDataFile&p_startYear=&p_c=&p_stn_num=023000)

<sup>6</sup>[http://www.bom.gov.au/jsp/ncc/cdio/weatherData/av?p\\_nccObsCode=122&p\\_display\\_type=dailyDataFile&p\\_startYear](http://www.bom.gov.au/jsp/ncc/cdio/weatherData/av?p_nccObsCode=122&p_display_type=dailyDataFile&p_startYear)

Across the afternoon, demand for electricity ranged from about 8800 MW to 9000 MW in Victoria and 2400 MW to 2600 MW in South Australia. This was around 300 MW lower than forecast four hours prior in Victoria (at 2.30 pm) and 150 MW in South Australia across the afternoon.

While demand for electricity was high in both regions, it has been much higher in the past. To put this in context, record maximum demand in Victoria reached 10 490 MW in January 2009, and 3397 MW in South Australia in January 2011. However, it is worth noting the closure of two power stations in recent times: Alinta's 540 MW Northern Power Station in South Australia in May 2016, and Engie's 1600 MW Hazelwood Power Station in Victoria in March 2017. These closures have reduced the amount of coal generation available in the two regions, some of which would traditionally have been offered at low prices.

## **Australian Energy Regulator**

### **March 2018**

## Appendix A: Significant Rebids

The rebidding tables highlight the relevant rebids submitted by generators. It details the time the rebid was submitted and used by the dispatch process, the capacity involved, the change in the price of the capacity was being offered and the rebid reason.

**Table 3: Significant energy rebids for 2.30 pm (Victoria)**

Submit time	Time effective	Participant	Station	Capacity rebid (MW)	Price from (\$/MWh)	Price to (\$/MWh)	Rebid reason
10.36 am		Origin Energy	Mortlake	62	<274	14200	1034A constraint management - v>>v_nil_3 sl
11.18 am		Snowy Hydro	Valley Power	-44	-1000	N/A	11:18:30 p update capability parameters for change to outage plan/plant conditions
11.52 am		Ecogen Energy	Jeeralang A	84	>11 501	<10 000	1150~A~ADJ bnds mat chnge vic 5p price @ 1245 \$9506~
12.27 pm		Snowy Hydro	Murray	30	14 194	-1000	12:26:00 A vic 5min pd price \$9,077.29 higher than 5min pd 12:50@12:21 (\$9,406.18)
1.56 pm	2.05 pm	Ecogen Energy	Jeeralang A	24	10 000	-1000	1345~A~adj bnds vic disp price 9999.81 abv fcast sl~
2.02 pm	2.10 pm	AGL Energy	Somerton	-34	0	N/A	1400~P~020 reduction in avail cap~204 unit trip 32mw

**Table 4: Significant energy rebids for 2.30 pm (South Australia)**

Submit time	Time effective	Participant	Station	Capacity rebid (MW)	Price from (\$/MWh)	Price to (\$/MWh)	Rebid reason
11.38 am		EnergyAustralia	Hallett	40	<369	13 999	1125-A-band adj due to material change in vic-sa net ic ~ vic import duration extended @1430 sl~
11.48 am		Engie	Mintaro	69	14 200	<119	1135-A-SA 5mpd higher than 30mpd: \$10,549.67 @ 12:45~
12.13 pm		EnergyAustralia	Hallett	30	13 999	<369	1205-A-ADJ bnds mat chnge sa 5p price @ 1250 10550 v 369 sl~
12.28 pm		Engie	Dry Creek	116	13 100	<300	1205-A-SA 5mpd higher than 30mpd \$10549.67 12:50~
12.36 pm		EnergyAustralia	Hallett	20	13 999	-1000	1225-A-adj bnds mat change sa 5p 1325 10549 ~
12.45 pm		Engie	Dry Creek	71	300	13 100	1230-A-SA price lower than 30mpd: \$113.81 < \$300.02 hhe 13:00~
1.52 pm		Origin Energy	Osborne	-20	100	N/A	1347E correct bid - evap enablement revised sl
2.08 pm	2.15 pm	EnergyAustralia	Hallett	25	<579	13 999	1355-A-ADJ bnds sa price 14200 abv 5p fcast sl~
2.09 pm	2.20 pm	Engie	Dry Creek	71	13 100	-1000	1330-A-respond to unforecast mpc~

Submit time	Time effective	Participant	Station	Capacity rebid (MW)	Price from (\$/MWh)	Price to (\$/MWh)	Rebid reason
2.09 pm	2.20 pm	Engie	Port Lincoln	20	14 200	-1000	1330~A~respond to unforecast mpc~
2.09 pm	2.20 pm	Engie	Snuggery	29	14 200	-1000	1330~A~respond to unforecast mpc~

**Table 5: Significant energy rebids for 3 pm (South Australia)**

Submit time	Time effective	Participant	Station	Capacity rebid (MW)	Price from (\$/MWh)	Price to (\$/MWh)	Rebid reason
11.38 am		EnergyAustralia	Hallett	40	<369	13 999	1125~A~band adj due to material change in vic-sa net ic ~ vic import duration extended @1430 SL~
11.48 am		Engie	Mintaro	69	14 200	<119	1135~A~SA 5mpd higher than 30mpd: \$10,549.67 @ 12:45~
12.13 pm		EnergyAustralia	Hallett	30	13 999	<369	1205~A~adj bnds mat chnge sa 5p price @ 1250 10550 v 369 sl~
12.36 pm		EnergyAustralia	Hallett	55	13 999	<10 579	1225~A~adj bnds mat change sa 5p 1325 10549 ~
1.43 pm		Origin Energy	Osborne	-20	100	N/A	1335A DEC SA dem 5pd 2446mw < 30pd 2579mw @1400 sl
1.52 pm		Origin Energy	Osborne	20	N/A	100	1347E correct bid - evap enablement revised sl
2.29 pm	2.40 pm	Engie	Dry Creek	60	13 100	300	1425~A~respond to mpc~

**Table 6: Significant energy rebids for 5 pm (South Australia)**

Submit time	Time effective	Participant	Station	Capacity rebid (MW)	Price from (\$/MWh)	Price to (\$/MWh)	Rebid reason
1.19 pm		AGL Energy	Torrens Island	85	14 200	105	1220~F~040 chg in contract pos~see log
2.14 pm		Origin Energy	Quarantine	25	13 099	-1000	1410A ensure economic dispatch - avoid short shutdown sl
2.34 pm		EnergyAustralia	Hallett	40	>10 579	<369	1425~P~adj avail bnds match ambient cond sl~

**Table 7: Significant energy rebids for 6 pm (South Australia)**

Submit time	Time effective	Participant	Station	Capacity rebid (MW)	Price from (\$/MWh)	Price to (\$/MWh)	Rebid reason
2.14 pm		Origin Energy	Quarantine	25	13 099	-1000	1410A ensure economic dispatch - avoid short shutdown sl
2.34 pm		EnergyAustralia	Hallett	40	>10 579	<369	1425~P~adj avail bnds match ambient cond sl~
3.38 pm		EnergyAustralia	Hallett	-20	<369	N/A	1535~P~adj avail due to gt 2-3 trip sl~
4.50 pm		Engie	Port Lincoln	40	14 200	-1000	1645~A~respond to constraint vs_250~
5.09 pm		AGL Energy	Torrens Island	40	105	14 200	1705~A~040 chg in aemo disp~44 price decrease vs pd sa \$135 v \$4511.77



## Appendix B: Price setter

The following table identifies for the trading intervals in which the spot price exceeded \$5000/MWh, each five minute dispatch interval price and the generating units involved in setting the energy price. This information is published by AEMO.<sup>7</sup> The 30-minute spot price is the average of the six dispatch interval prices. The prices shown are a result of the “what-if” pricing calculation.

**Table 8: Victoria – 2.30 pm**

DI	Dispatch Price (\$/MWh)	Participant	Unit	Service	Offer price (\$/MWh)	Marginal change	Contribution
14:05	\$163.98	Origin Energy	MORTLK12	Energy	\$163.98	1.00	\$163.98
14:10	\$12 916.15	Hornsdale Power Reserve	HPRG1	Energy	\$14 200.00	0.16	\$2272.00
		Engie	POR01	Energy	\$14 200.00	0.07	\$994.00
		AGL (SA)	TORRA1	Energy	\$14 200.00	0.06	\$852.00
		AGL (SA)	TORRA3	Energy	\$14 200.00	0.07	\$994.00
		AGL (SA)	TORRA4	Energy	\$14 200.00	0.06	\$852.00
		AGL (SA)	TORRB1	Energy	\$14 200.00	0.12	\$1704.00
		AGL (SA)	TORRB2	Energy	\$14 200.00	0.12	\$1704.00
		AGL (SA)	TORRB3	Energy	\$14 200.00	0.12	\$1704.00
		AGL (SA)	TORRB4	Energy	\$14 200.00	0.12	\$1704.00
14:15	\$13 115.56	Engie	POR01	Energy	\$14 200.00	0.09	\$1278.00
		AGL (SA)	TORRA1	Energy	\$14 200.00	0.07	\$994.00
		AGL (SA)	TORRA3	Energy	\$14 200.00	0.08	\$1136.00
		AGL (SA)	TORRA4	Energy	\$14 200.00	0.07	\$994.00
		AGL (SA)	TORRB1	Energy	\$14 200.00	0.15	\$2130.00
		AGL (SA)	TORRB2	Energy	\$14 200.00	0.15	\$2130.00
		AGL (SA)	TORRB3	Energy	\$14 200.00	0.15	\$2130.00
		AGL (SA)	TORRB4	Energy	\$14 200.00	0.15	\$2130.00
14:20	\$13 249.46	Hornsdale Power Reserve	HPRG1	Energy	\$14 200.00	0.17	\$2414.00

<sup>7</sup> Details on how the price is determined can be found at [www.aemo.com.au](http://www.aemo.com.au)

DI	Dispatch Price (\$/MWh)	Participant	Unit	Service	Offer price (\$/MWh)	Marginal change	Contribution
		Engie	POR01	Energy	\$14 200.00	0.09	\$1278.00
		AGL (SA)	TORRA1	Energy	\$14 200.00	0.06	\$852.00
		AGL (SA)	TORRA3	Energy	\$14 200.00	0.07	\$994.00
		AGL (SA)	TORRA4	Energy	\$14 200.00	0.06	\$852.00
		AGL (SA)	TORRB1	Energy	\$14 200.00	0.12	\$1704.00
		AGL (SA)	TORRB2	Energy	\$14 200.00	0.12	\$1704.00
		AGL (SA)	TORRB3	Energy	\$14 200.00	0.12	\$1704.00
		AGL (SA)	TORRB4	Energy	\$14 200.00	0.12	\$1704.00
14:25	\$12 002.72	AGL (SA)	TORRA1	Energy	\$14 200.00	0.09	\$1278.00
		AGL (SA)	TORRA3	Energy	\$14 200.00	0.10	\$1420.00
		AGL (SA)	TORRA4	Energy	\$14 200.00	0.09	\$1278.00
		AGL (SA)	TORRB1	Energy	\$14 200.00	0.18	\$2556.00
		AGL (SA)	TORRB2	Energy	\$14 200.00	0.18	\$2556.00
		AGL (SA)	TORRB3	Energy	\$14 200.00	0.18	\$2556.00
		AGL (SA)	TORRB4	Energy	\$14 200.00	0.18	\$2556.00
14:30	\$9466.67	Engie	POR01	Energy	\$14 200.00	0.10	\$1420.00
		AGL (SA)	TORRA1	Energy	\$14 200.00	0.08	\$1136.00
		AGL (SA)	TORRA3	Energy	\$14 200.00	0.09	\$1278.00
		AGL (SA)	TORRA4	Energy	\$14 200.00	0.08	\$1136.00
		AGL (SA)	TORRB1	Energy	\$14 200.00	0.16	\$2272.00
		AGL (SA)	TORRB2	Energy	\$14 200.00	0.16	\$2272.00
		AGL (SA)	TORRB3	Energy	\$14 200.00	0.16	\$2272.00
		AGL (SA)	TORRB4	Energy	\$14 200.00	0.16	\$2272.00

**Spot Price \$10 152/MWh**

**Table 9: South Australia – 2.30 pm**

DI	Dispatch Price (\$/MWh)	Participant	Unit	Service	Offer price (\$/MWh)	Marginal change	Contribution
14:05	\$185.74	Origin Energy	MORTLK12	Energy	\$163.98	1.13	\$185.30
14:10	\$14 200.00	Hornsdale Power Reserve	HPRG1	Energy	\$14 200.00	0.18	\$2556.00
		Engie	POR01	Energy	\$14 200.00	0.08	\$1136.00
		AGL (SA)	TORRA1	Energy	\$14 200.00	0.06	\$852.00
		AGL (SA)	TORRA3	Energy	\$14 200.00	0.07	\$994.00
		AGL (SA)	TORRA4	Energy	\$14 200.00	0.06	\$852.00
		AGL (SA)	TORRB1	Energy	\$14 200.00	0.14	\$1988.00
		AGL (SA)	TORRB2	Energy	\$14 200.00	0.14	\$1988.00
14:15	\$14 200.00	Engie	POR01	Energy	\$14 200.00	0.10	\$1420.00
		AGL (SA)	TORRA1	Energy	\$14 200.00	0.08	\$1136.00
		AGL (SA)	TORRA3	Energy	\$14 200.00	0.09	\$1278.00
		AGL (SA)	TORRA4	Energy	\$14 200.00	0.08	\$1136.00
		AGL (SA)	TORRB1	Energy	\$14 200.00	0.16	\$2272.00
		AGL (SA)	TORRB2	Energy	\$14 200.00	0.16	\$2272.00
		AGL (SA)	TORRB3	Energy	\$14 200.00	0.16	\$2272.00
		AGL (SA)	TORRB4	Energy	\$14 200.00	0.16	\$2272.00
14:20	\$14 200.00	Hornsdale Power Reserve	HPRG1	Energy	\$14 200.00	0.18	\$2556.00
		Engie	POR01	Energy	\$14 200.00	0.10	\$1420.00
		AGL (SA)	TORRA1	Energy	\$14 200.00	0.06	\$852.00
		AGL (SA)	TORRA3	Energy	\$14 200.00	0.07	\$994.00
		AGL (SA)	TORRA4	Energy	\$14 200.00	0.06	\$852.00
		AGL (SA)	TORRB1	Energy	\$14 200.00	0.13	\$1846.00
		AGL (SA)	TORRB2	Energy	\$14 200.00	0.13	\$1846.00
14:25	\$14 200.00	AGL (SA)	TORRA1	Energy	\$14 200.00	0.09	\$1278.00
		AGL (SA)	TORRA3	Energy	\$14 200.00	0.10	\$1420.00
		AGL (SA)	TORRA4	Energy	\$14 200.00	0.09	\$1278.00

		AGL (SA)	TORRB1	Energy	\$14 200.00	0.18	\$2556.00
		AGL (SA)	TORRB2	Energy	\$14 200.00	0.18	\$2556.00
		AGL (SA)	TORRB3	Energy	\$14 200.00	0.18	\$2556.00
		AGL (SA)	TORRB4	Energy	\$14 200.00	0.18	\$2556.00
14:30	\$14 200.00	Engie	POR01	Energy	\$14 200.00	0.10	\$1420.00
		AGL (SA)	TORRA1	Energy	\$14 200.00	0.08	\$1136.00
		AGL (SA)	TORRA3	Energy	\$14 200.00	0.09	\$1278.00
		AGL (SA)	TORRA4	Energy	\$14 200.00	0.08	\$1136.00
		AGL (SA)	TORRB1	Energy	\$14 200.00	0.16	\$2272.00
		AGL (SA)	TORRB2	Energy	\$14 200.00	0.16	\$2272.00
		AGL (SA)	TORRB3	Energy	\$14 200.00	0.16	\$2272.00
		AGL (SA)	TORRB4	Energy	\$14 200.00	0.16	\$2272.00

**Spot Price \$11 864/MWh**

**Table 10: South Australia – 3 pm**

DI	Dispatch Price (\$/MWh)	Participant	Unit	Service	Offer price (\$/MWh)	Marginal change	Contribution
14:35	\$14 200.00	Engie	POR01	Energy	\$14 200.00	0.09	\$12 78.00
		AGL (SA)	TORRA1	Energy	\$14 200.00	0.08	\$1136.00
		AGL (SA)	TORRA3	Energy	\$14 200.00	0.08	\$1136.00
		AGL (SA)	TORRA4	Energy	\$14 200.00	0.08	\$1136.00
		AGL (SA)	TORRB1	Energy	\$14 200.00	0.16	\$2272.00
		AGL (SA)	TORRB2	Energy	\$14 200.00	0.16	\$2272.00
		AGL (SA)	TORRB3	Energy	\$14 200.00	0.16	\$2272.00
		AGL (SA)	TORRB4	Energy	\$14 200.00	0.17	\$2414.00
14:40	\$14 200.00	Engie	MINTARO	Energy	\$14 200.00	0.10	\$14 20.00
		Engie	POR01	Energy	\$14 200.00	0.08	\$1136.00
		Engie	POR03	Energy	\$14 200.00	0.02	\$284.00
		AGL (SA)	TORRA1	Energy	\$14 200.00	0.07	\$994.00
		AGL (SA)	TORRA3	Energy	\$14 200.00	0.07	\$994.00

DI	Dispatch Price (\$/MWh)	Participant	Unit	Service	Offer price (\$/MWh)	Marginal change	Contribution
		AGL (SA)	TORRA4	Energy	\$14 200.00	0.07	\$994.00
		AGL (SA)	TORRB1	Energy	\$14 200.00	0.14	\$1988.00
		AGL (SA)	TORRB2	Energy	\$14 200.00	0.14	\$1988.00
		AGL (SA)	TORRB3	Energy	\$14 200.00	0.14	\$1988.00
		AGL (SA)	TORRB4	Energy	\$14 200.00	0.15	\$2130.00
14:45	\$14 200.00	Engie	POR01	Energy	\$14 200.00	0.08	\$1136.00
		Engie	POR03	Energy	\$14 200.00	0.02	\$284.00
		Engie	SNUG1	Energy	\$14 200.00	0.09	\$1278.00
		AGL (SA)	TORRA1	Energy	\$14 200.00	0.07	\$994.00
		AGL (SA)	TORRA3	Energy	\$14 200.00	0.07	\$994.00
		AGL (SA)	TORRA4	Energy	\$14 200.00	0.07	\$994.00
		AGL (SA)	TORRB1	Energy	\$14 200.00	0.14	\$1988.00
		AGL (SA)	TORRB2	Energy	\$14 200.00	0.14	\$1988.00
		AGL (SA)	TORRB3	Energy	\$14 200.00	0.14	\$1988.00
		AGL (SA)	TORRB4	Energy	\$14 200.00	0.15	\$2130.00
14:50	\$14 200.00	Engie	POR01	Energy	\$14 200.00	0.08	\$1136.00
		Engie	POR03	Energy	\$14 200.00	0.02	\$284.00
		Engie	SNUG1	Energy	\$14 200.00	0.09	\$1278.00
		AGL (SA)	TORRA1	Energy	\$14 200.00	0.07	\$994.00
		AGL (SA)	TORRA3	Energy	\$14 200.00	0.07	\$994.00
		AGL (SA)	TORRA4	Energy	\$14 200.00	0.07	\$994.00
		AGL (SA)	TORRB1	Energy	\$14 200.00	0.14	\$1988.00
		AGL (SA)	TORRB2	Energy	\$14 200.00	0.14	\$1988.00
		AGL (SA)	TORRB3	Energy	\$14 200.00	0.14	\$1988.00
		AGL (SA)	TORRB4	Energy	\$14 200.00	0.15	\$2130.00
14:55	\$13 100.03	Engie	POR01	Energy	\$13100.03	1.00	\$13 100.03
15:00	\$10 549.67	Origin Energy	QPS5	Energy	\$10549.67	1.00	\$10 549.67

**Spot Price \$13 408/MWh**

**Table 11: South Australia – 5 pm**

DI	Dispatch Price (\$/MWh)	Participant	Unit	Service	Offer price (\$/MWh)	Marginal change	Contribution
16:35	\$10 549.67	Origin Energy	QPS5	Energy	\$10 549.67	1.00	\$10 549.67
16:40	\$10 791.26	Ecogen Energy	JLA01	Energy	\$9999.81	0.17	\$1699.97
		Ecogen Energy	JLA02	Energy	\$9999.81	0.17	\$1699.97
		Ecogen Energy	JLB01	Energy	\$9999.81	0.25	\$2499.95
		Ecogen Energy	JLB02	Energy	\$9999.81	0.25	\$2499.95
		Ecogen Energy	JLB03	Energy	\$9999.81	0.25	\$2499.95
16:45	\$10 549.67	Origin Energy	QPS5	Energy	\$10 549.67	1.00	\$10 549.67
16:50	\$146.43	Stanwell	STAN-1	Energy	\$106.79	0.34	\$36.31
		Stanwell	STAN-2	Energy	\$106.79	0.34	\$36.31
		Stanwell	STAN-3	Energy	\$106.79	0.34	\$36.31
		Stanwell	STAN-4	Energy	\$106.79	0.34	\$36.31
16:55	\$304.63	Hornsedale Power Reserve	HPRG1	Energy	\$304.63	1.00	\$304.63
17:00	\$135.00	AGL (SA)	TORRA1	Energy	\$135.00	0.09	\$12.15
		AGL (SA)	TORRA3	Energy	\$135.00	0.09	\$12.15
		AGL (SA)	TORRA4	Energy	\$135.00	0.09	\$12.15
		AGL (SA)	TORRB1	Energy	\$135.00	0.18	\$24.30
		AGL (SA)	TORRB2	Energy	\$135.00	0.18	\$24.30
		AGL (SA)	TORRB3	Energy	\$135.00	0.18	\$24.30
		AGL (SA)	TORRB4	Energy	\$135.00	0.18	\$24.30

**Spot Price \$5413/MWh**

**Table 12: South Australia – 6 pm**

DI	Dispatch Price (\$/MWh)	Participant	Unit	Service	Offer price (\$/MWh)	Marginal change	Contribution
17:35	\$10 549.67	Origin Energy	QPS5	Energy	\$10 549.67	1.00	\$10 549.67
17:40	\$10 549.67	Origin Energy	QPS5	Energy	\$10 549.67	1.00	\$10 549.67
17:45	\$10 549.67	Origin Energy	QPS5	Energy	\$10 549.67	1.00	\$10 549.67
17:50	\$135.00	AGL (SA)	TORRA1	Energy	\$135.00	0.09	\$12.15
		AGL (SA)	TORRA3	Energy	\$135.00	0.09	\$12.15
		AGL (SA)	TORRA4	Energy	\$135.00	0.09	\$12.15
		AGL (SA)	TORRB1	Energy	\$135.00	0.18	\$24.30
		AGL (SA)	TORRB2	Energy	\$135.00	0.18	\$24.30
		AGL (SA)	TORRB3	Energy	\$135.00	0.18	\$24.30
		AGL (SA)	TORRB4	Energy	\$135.00	0.18	\$24.30
17:55	\$105.00	AGL (SA)	TORRA1	Energy	\$105.00	0.11	\$11.55
		AGL (SA)	TORRA3	Energy	\$105.00	0.09	\$9.45
		AGL (SA)	TORRA4	Energy	\$105.00	0.11	\$11.55
		AGL (SA)	TORRB1	Energy	\$105.00	0.17	\$17.85
		AGL (SA)	TORRB2	Energy	\$105.00	0.17	\$17.85
		AGL (SA)	TORRB3	Energy	\$105.00	0.17	\$17.85
		AGL (SA)	TORRB4	Energy	\$105.00	0.17	\$17.85
18:00	\$105.00	AGL (SA)	TORRA1	Energy	\$105.00	0.11	\$11.55
		AGL (SA)	TORRA3	Energy	\$105.00	0.09	\$9.45
		AGL (SA)	TORRA4	Energy	\$105.00	0.11	\$11.55
		AGL (SA)	TORRB1	Energy	\$105.00	0.17	\$17.85
		AGL (SA)	TORRB2	Energy	\$105.00	0.17	\$17.85
		AGL (SA)	TORRB3	Energy	\$105.00	0.17	\$17.85
		AGL (SA)	TORRB4	Energy	\$105.00	0.17	\$17.85

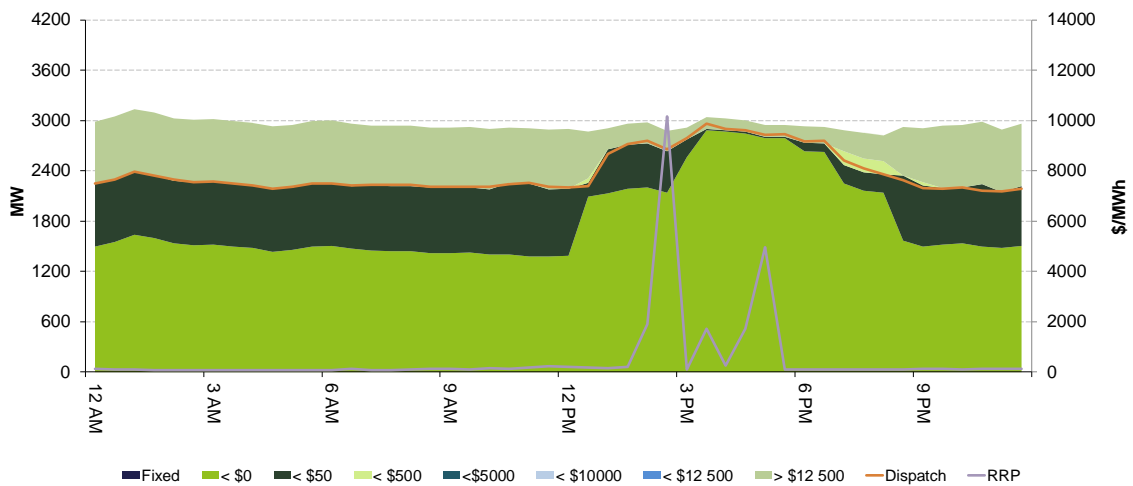
**Spot Price \$5332/MWh**

## Appendix C: Closing bids

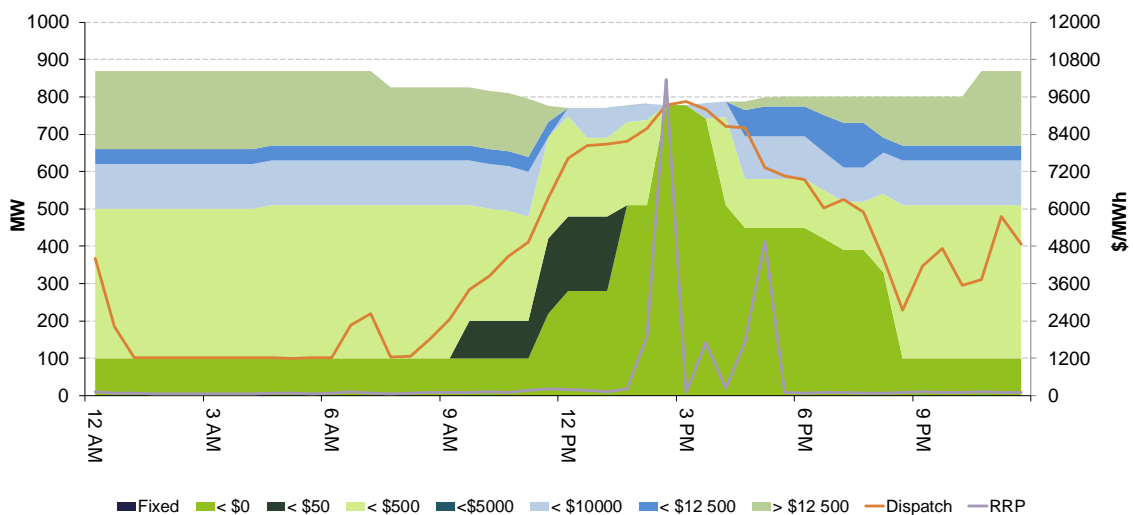
Figures C1 to C6 highlight the half hour closing bids for participants in Victoria and South Australia with significant capacity priced at or above \$5000/MWh during the periods in which the spot price exceeded \$5000/MWh. They also show generation output and the spot price.

### Victoria

**Figure C1 – AGL Energy (Somerton, Dartmouth, Loy Yang A, Macarthur WF, Oaklands Hill WF, West Kiewa) closing bids, dispatch and spot price**

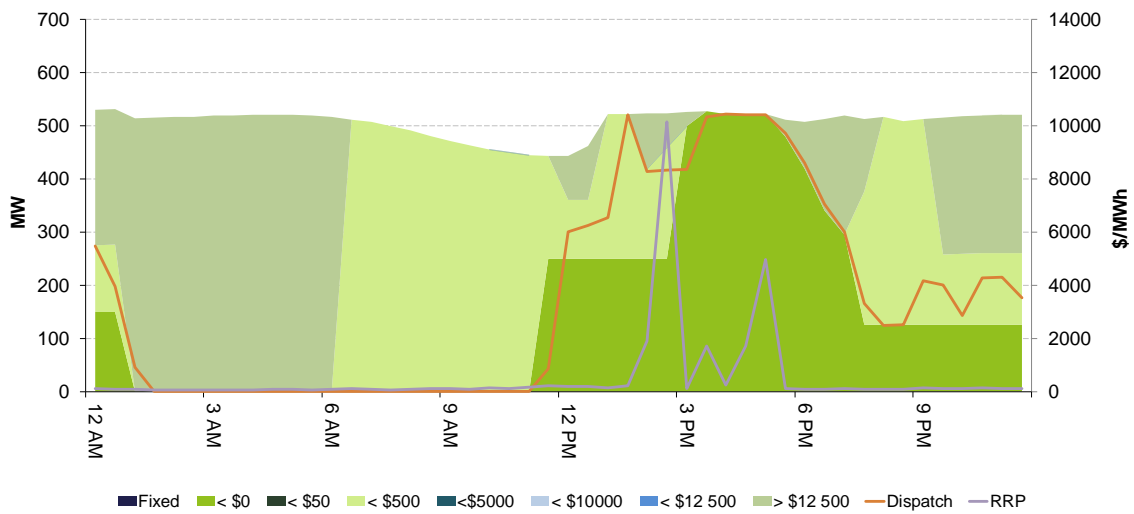


**Figure C2 – Ecogen Energy (Jeeralang A, Jeeralang B, Newport) closing bids, dispatch and spot price**



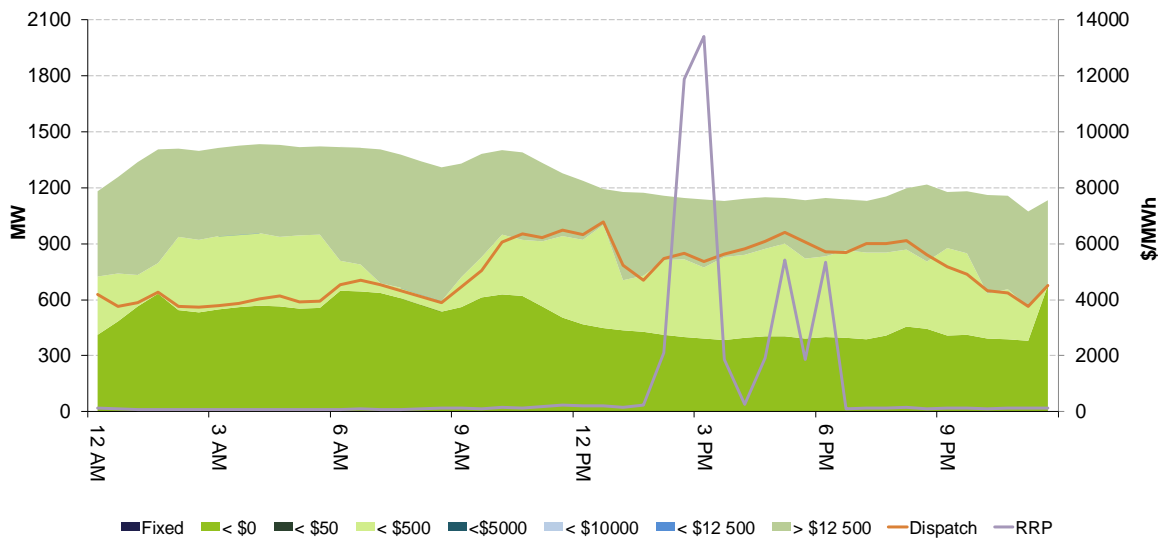


**Figure C3 – Origin Energy (Mortlake) closing bids, dispatch and spot price**

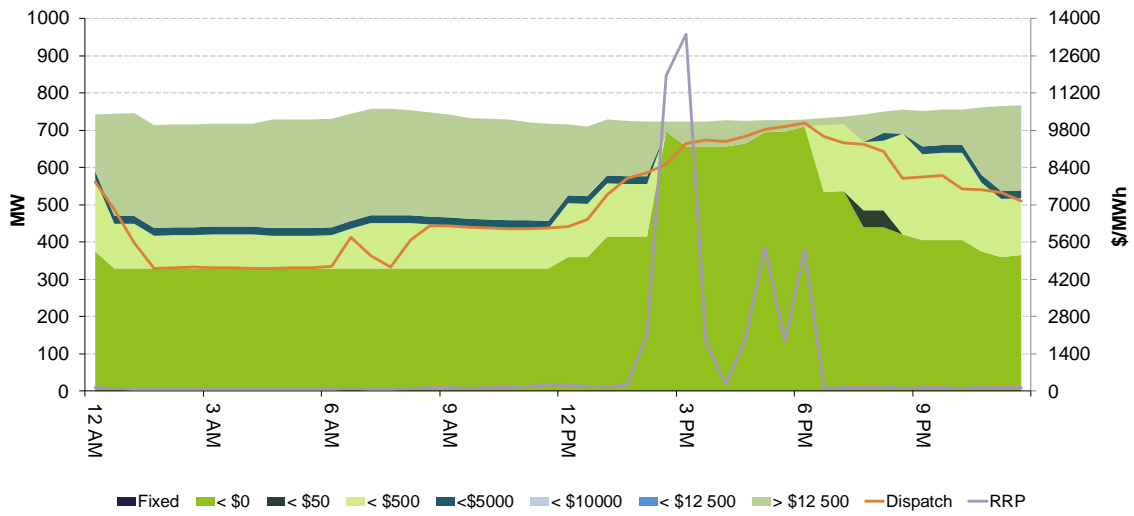


## South Australia

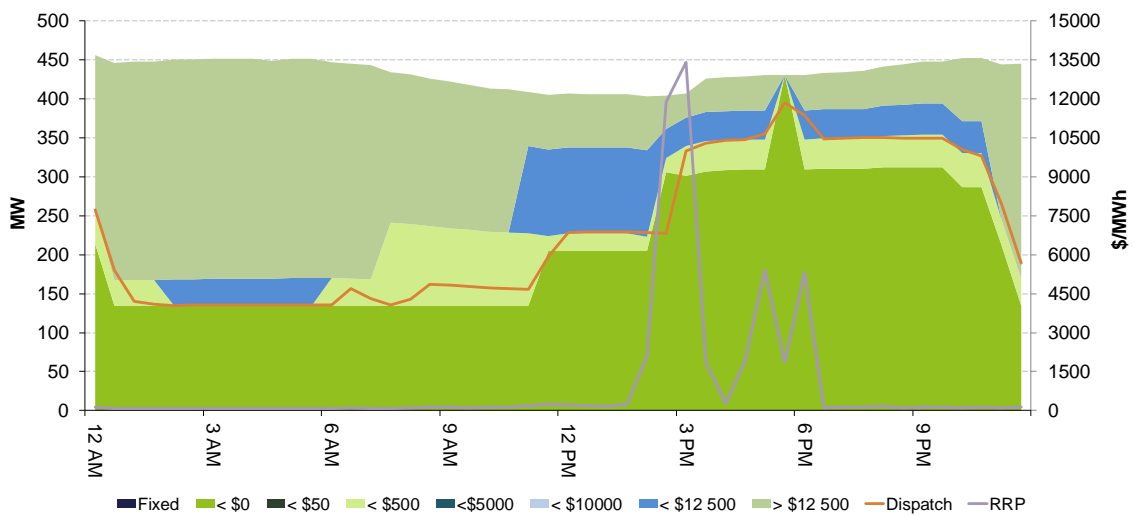
**Figure C4 – AGL Energy (The Bluff WF, Hallett 1 WF, Hallett 2 WF, North Brown Hill WF, Torrens Island) closing bids, dispatch and spot price**



**Figure C5 – Engie (Dry Creek, Mintaro, Pelican Point, Port Lincoln, Snuggery) closing bids, dispatch and spot price**



**Figure C6 – Origin Energy (Ladbroke Grove, Osborne, Quarantine) closing bids, dispatch and spot price**



## Appendix D: Relevant Market Notices

Table 13 and Table 14 highlight the market notices which relate to lack of reserve conditions in Victoria and South Australia respectively.

**Table 13: Lack of reserves - Victoria**

Market notice	Time	LOR	Contingent capacity requirement	Minimum reserve capacity available
60762	2.55 pm (16 Jan)	Forecast LOR1	1120	852
60773	3.21 pm (17 Jan)	Forecast LOR1	1100	788
60793	12.58 pm (18 Jan)	Forecast LOR2	560	456
60795	3.19 pm (18 Jan)	Forecast LOR2	560	476
At 5 pm (18 <sup>th</sup> Jan) AEMO announce intention to implement RERT contracts for 19 January				
60828	4.52 am (19 Jan)	Forecast LOR1	1100	679
60833	8.28 am (19 Jan)	Forecast LOR2	560	287
60836	8.39 am (19 Jan)	Forecast LOR1	1100	287
60837	11.10 am (19 Jan)	Forecast LOR2	560	157
60845	1.49 pm (19 Jan)	Forecast LOR2	560	32
<b>RERT Contracts activated from 2 pm</b>				
60847	2.02 pm (19 Jan)	Actual LOR1	1120	32
60849	2.44 pm (19 Jan)	Actual LOR1	1120	979

**Table 14: Lack of reserves – South Australia**

Market notice	Time	LOR	Contingent capacity requirement	Minimum reserve capacity available
60834	8.28 am (19 Jan)	Forecast LOR2	350	287

60835	8.35 am (19 Jan)	Forecast LOR1	600	287
60838	11.10 am (19 Jan)	Forecast LOR2	350	157
<b>RERT Contracts activated from 2 pm</b>				
60846	1.49 pm (19 Jan)	Forecast LOR2	350	32

This following market notices published by AEMO are relevant to the high price events which occurred on the day.

Market Notice	Type	Date of issue	Last Changed
60798	Market Intervention	18/01/2018 17:00:01	18/01/2018 17:00:01

#### External Reference

INTENTION TO IMPLEMENT an AEMO INTERVENTION EVENT WITH RERT

#### Reason

AEMO ELECTRICITY MARKET NOTICE.

AEMO Intervention Event, Reliability and Emergency Reserve Trader (RERT)- VIC Region- Friday , 19 January 2018

Refer to AEMO Electricity Market Notice no 60795

AEMO has entered into a reserve contract and may implement a AEMO Intervention Event by dispatching that reserve contract to maintain the power system in a reliable operating state during the following period of time;

1430 hrs to 1830 hrs. 19/01/2018

AEMO will issue a further advice if the reserve contract is activated.

Manager NEM Real Time Operations

Market Notice	Type	Date of issue	Last Changed
60840	Market Intervention	19/01/2018 11:22:37	19/01/2018 11:22:37

#### External Reference

INTENTION TO COMMENCE RERT CONTRACT NEGOTIATIONS

#### Reason

AEMO ELECTRICITY MARKET NOTICE.

Reliability and Emergency Reserve Trader (RERT) Intention to negotiate for additional reserve- VIC Region- Friday, 19 January 2018

Refer to AEMO Electricity Market Notice no. 60837

AEMO intends to commence negotiations with RERT Panel members for the provision of additional reserve by issuing requests for tender for the following period of time;

1400 hrs to 1700 hrs 19/01/2018

Manager NEM Real Time Operations

Market Notice	Type	Date of issue	Last Changed
60843	Market Intervention	19/01/2018 13:43:06	19/01/2018 13:43:06

#### External Reference

RERT DISPATCHED

#### Reason

RERT DISPATCHED

AEMO ELECTRICITY MARKET NOTICE.

AEMO Intervention Event, Reliability and Emergency Reserve Trader (RERT).- VIC Region- 19/01/2018

Refer AEMO Electricity Market Notices 60798 & 60840

AEMO has activated reserve contract(s) to maintain the power system in a reliable operating state.

The reserve contract(s) were activated for effect at 1400 hrs 19/01/2018 and are forecast to apply until 2000 hrs 19/01/2018.

AEMO has implemented an AEMO intervention event for the duration the reserve contract(s) is activated.

To facilitate the RERT process, constraints commencing with the following identifiers will be evident at various times in dispatch.

#RT\_VIC

Manager NEM Real Time Operations

Market Notice	Type	Date of issue	Last Changed
60844	Market Intervention	19/01/2018 13:42:46	19/01/2018 13:42:46

#### External Reference

AEMO Intervention Event - Intervention price dispatch intervals - 19/01/2018

#### Reason

AEMO ELECTRICITY MARKET NOTICE.

AEMO Intervention Event - Intervention price dispatch intervals - 19/01/2018

Refer AEMO Electricity Market Notices 60798 & 60840

An AEMO Intervention Event has been implemented by activating Reliability and Emergency Reserve Trader (RERT) to maintain the power system in a reliable operating state.

The AEMO Intervention Event commenced in the 1405 hrs dispatch interval and is forecast to apply until 2000 hrs 19/01/2018

AEMO declares all dispatch intervals during the AEMO Intervention Event to be intervention price dispatch intervals.

The event is expected to affect dispatch quantities for intervention pricing purposes from the 1405 hrs dispatch interval on 19/01/2018

Manager NEM Real Time Operations

Market Notice	Type	Date of issue	Last Changed
60859	MARKET INTERVENTION	19/01/2018 20:05:22	19/01/2018 20:05:22

#### External Reference

Cancellation - RERT DISPATCH 19/1/2018

#### Reason

AEMO ELECTRICITY MARKET NOTICE.

Cancellation - AEMO Intervention Event, Reliability and Emergency Reserve Trader (RERT).- VIC Region- 19/01/2018

Refer AEMO Electricity Market Notices 60798 & 60840

AEMO has de-activated reserve contract(s) to maintain the power system in a reliable operating state.

The reserve contract(s) were activated from 1400 hrs 19/01/2018 to 2000 hrs 19/01/2018.

Manager NEM Real Time Operations

Market Notice	Type	Date of issue	Last Changed
60860	MARKET INTERVENTION	19/01/2018 20:05:44	19/01/2018 20:05:44

#### External Reference

COMPLETION OF AEMO INTERVENTION EVENT - 19/01/2018

#### Reason

AEMO ELECTRICITY MARKET NOTICE.

The AEMO Intervention Event referred to in Market Notice No. 60844 on 19/01/2018 has ended.

Manager NEM Real Time Operations

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## Appendix E: Pricing during an intervention

At times, AEMO, may need to override the normal dispatch process to maintain system security. In accordance with the National Electricity Rules (NER) a dispatch interval where an AEMO intervention event occurs, must be declared an intervention price dispatch interval and set the energy and FCAS prices for all regions as if AEMO had not intervened in the market. An intervention pricing interval is declared when AEMO directs a participant to operate plant other than in accordance with dispatch instructions, or activates a reliability and emergency reserve trader (RERT) contract.

RERT contracts refer to specific arrangements by AEMO by which additional capacity may be made available under special circumstances. AEMO may dispatch or activate RERT contract(s) to address a power system security situation.

Under normal operations AEMO sets targets for generation and interconnectors and determines wholesale electricity market prices (energy and FCAS) in a single calculation for every five minute dispatch interval. Under “Intervention pricing” these are calculated twice for each dispatch interval, one taking into account the direction called “Intervention” and one that does not include the direction called “What-if”.

The “Intervention” calculation takes into account the direction by AEMO (in this case at Pelican Point) and is used to set targets for generation in order to meet demand. The pricing outcome of this calculation is not received by the generators.

The “What-If” calculation does not take the direction into account and is used to calculate the wholesale electricity market price and is received by generators. The generation targets calculated are not used to dispatch generation.

These calculations dispatch generation to meet demand (intervention calculation) while providing the pricing signal to indicate a shortage of supply (what-if calculation).

**Table 15: “What-if” and intervention pricing outcomes**

Trading interval	What-if pricing (\$/MWh)		Intervention pricing (\$/MWh)	
	Victoria	South Australia	Victoria	South Australia
2.30 pm	10 152	11 864	5723	6369
3.00 pm	104	13408	95	2488
3.30 pm	1710	1856	105	118
4.00 pm	243	268	112	128
4.30 pm	1717	1913	1677	1891
5.00 pm	4967	5413	190	218
5.30 pm	101	1865	96	1863
6.00 pm	90	5332	85	5332



## Appendix F: Lack of Reserve explained

AEMO is required to monitor the level of reserve, or spare capacity, within each region of the NEM. Reserves are defined as the difference between the volume of electricity that can be made available to consumers, either by local generation or through the network from other regions of the NEM, and the regional customer demand at that time.

Reserves are an indicator of the supply demand balance and an important tool to communicate with the market potential and actual shortfalls. This is achieved through the release of LOR notices by AEMO. Forecast LOR notices are designed to elicit a market response from generators to increase their declared available capacity or retailers to reduce demand to address any forecast reserve shortfalls. Actual LOR notices are also issued when the thresholds are actually triggered.

There are three reserve thresholds, which relate to managing power system security following a defined number of unplanned failures of either transmission or generating equipment (credible contingencies). An example of a credible contingency would be the failure of a large generator or the failure of a transmission line that would reduce interconnector capacity.

The three LOR levels are broadly categorised as follows:<sup>8</sup>

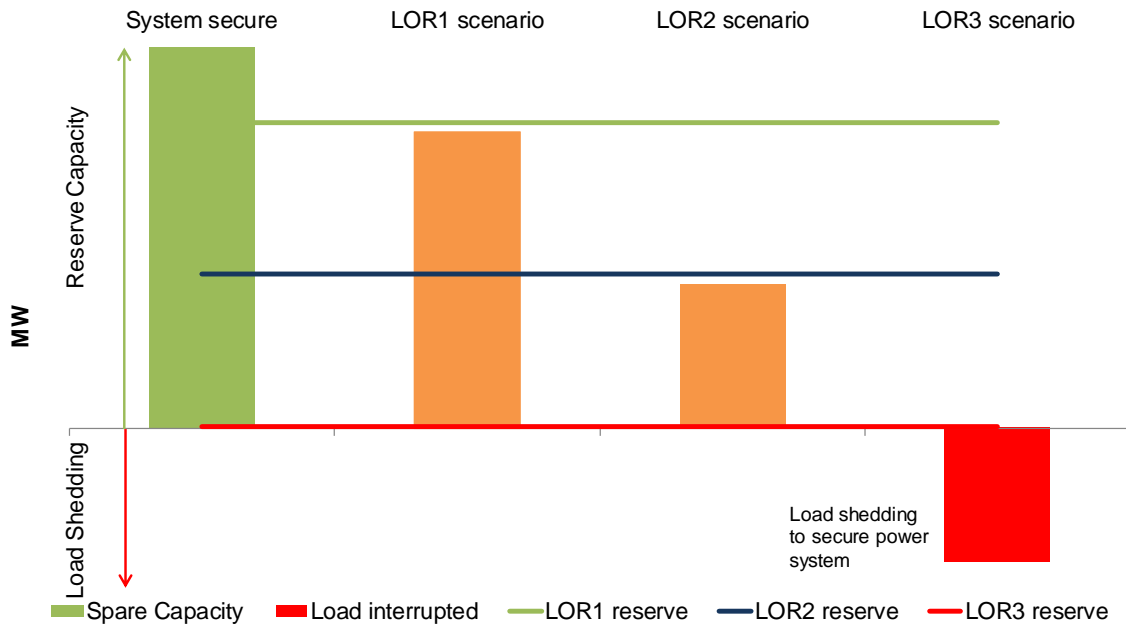
- An LOR1 is declared when AEMO considers load shedding is likely to occur after two single credible contingencies.
- An LOR2 is declared when AEMO considers load shedding is likely to occur after a single credible contingency.
- An LOR3 is declared when customer(s) load would be, or is, shed in order to maintain the security of the power system.

Figure 4 shows the four possible spare capacity and the lack of reserve threshold situations graphically.

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<sup>8</sup> These definitions have been simplified for the sake of readability. An interactive glossary of electricity market terms can be found on the AEMO website at: <https://www.aemo.com.au/Datasource/Archives/Archive1767#>

**Figure 4: Spare capacity and lack of reserve**



Assuming that the horizontal axis line represents a situation when supply equals demand, then excess generating capacity (above the x axis) amounts to spare or reserve capacity. As discussed above, the three reserve levels are shown as three horizontal lines, reserve requirements for LOR1 in green, for LOR2 in blue and where there are no reserves and all capacity is being used to meet demand, LOR3, in red.

The solid green and amber blocks represent spare capacity. As the spare capacity drops below a reserve line (the horizontal lines) either by a reduction in available capacity or an increase in demand, a new reserve condition exists. AEMO monitors this situation continuously and issues LOR notices to inform participants.

When there is insufficient capacity to meet demand load must be shed (customers interrupted) and an LOR3 is issued.